Power to Gas in EU Energy Policy

Jyri Ylkanen
European Commission – Energy

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Energy in the EU

Results achieved…

- Greenhouse gas emissions fell 18% (1990-2011).
- Energy efficiency savings: 15.5 % (2013).
- Share of Renewables: 15.0% (2013).
- European renewable energy businesses have a combined annual turnover of €129 billion, employing over 1 million people.

Source: Directorate-General for Energy

Climate and energy: where do we stand?

- **Developments since the 2009 Energy and Climate change package**

Renewable energy saw rapid cost decreases
Technologies are gradually becoming competitive
But large scale integration is a challenge

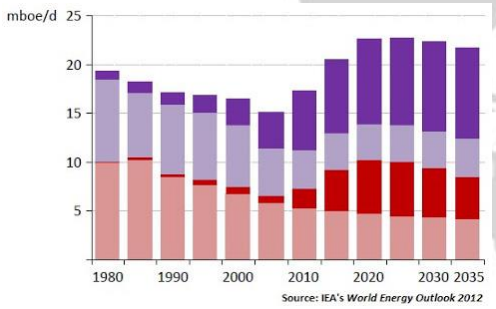
Impact of the financial crisis
Fall in private investment, tight financing conditions

Fukushima

Some countries phase out nuclear power production

Ukraine

Shale gas
US oil and gas production



Unconventional gas
Unconventional oil
Conventional gas
Conventional oil

Rising demand -> rising prices
By 2030, world economy set to double and energy demand to rise by 1/3

Major energy challenges in Europe

- Import Dependency
- Energy Prices
- Decarbonisation
- Technology mix

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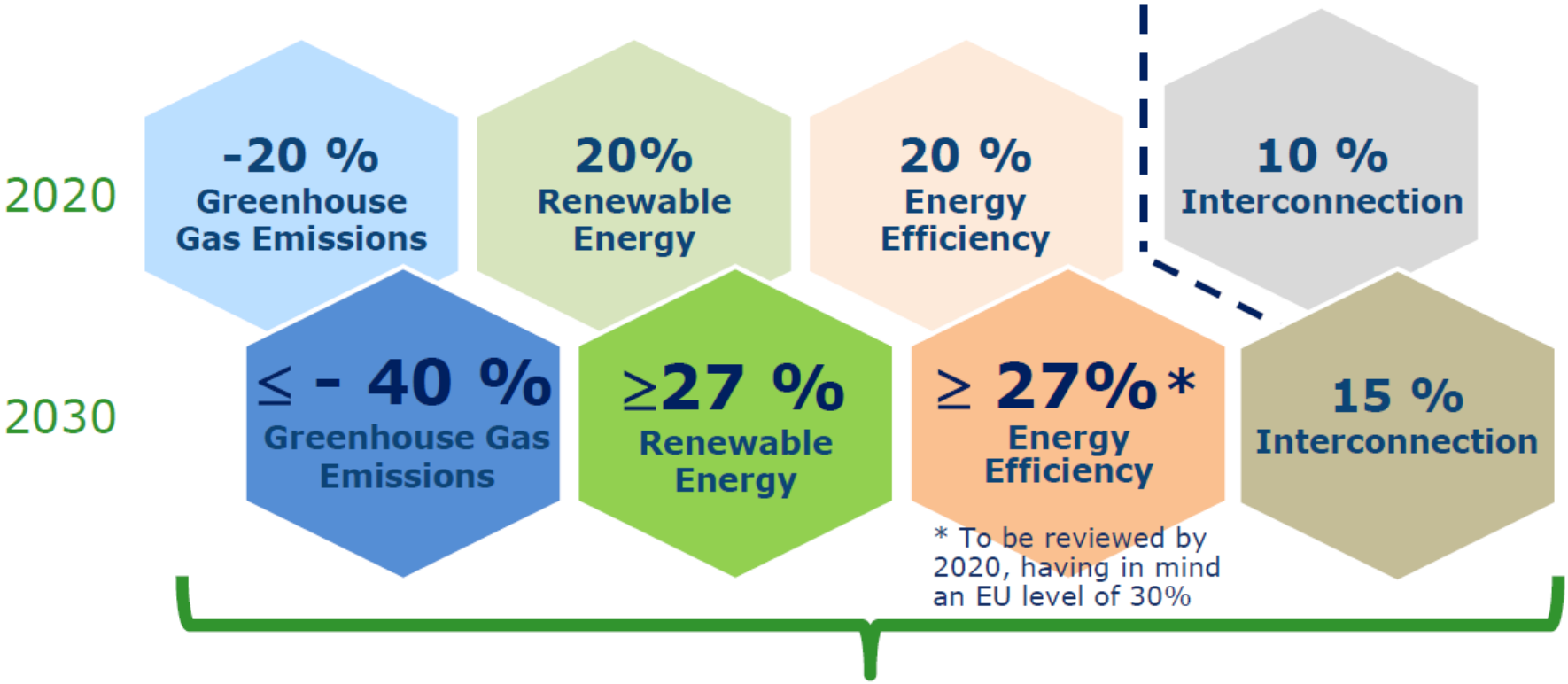
2030 framework for climate and energy policies



The EU Energy Security Strategy

Main messages:

Energy security is inseparable from 2030 climate and energy policy framework.

We need to act now to ensure supplies this winter and in the medium-long term:

Moderate energy demand	Increase sustainable energy production
Emergency and security mechanisms	Including our neighbours
More integrated energy market	Intensify our diversification efforts
Accelerate interconnections	Full use of EU financial instruments
Compliance of infrastructure projects	Coordination of national energy policies
Coherent external energy policy	Synergy with foreign policy instruments

The way towards:

The Energy Union

Where we want to go:

A secure, sustainable, competitive, affordable energy for every European

What this means:

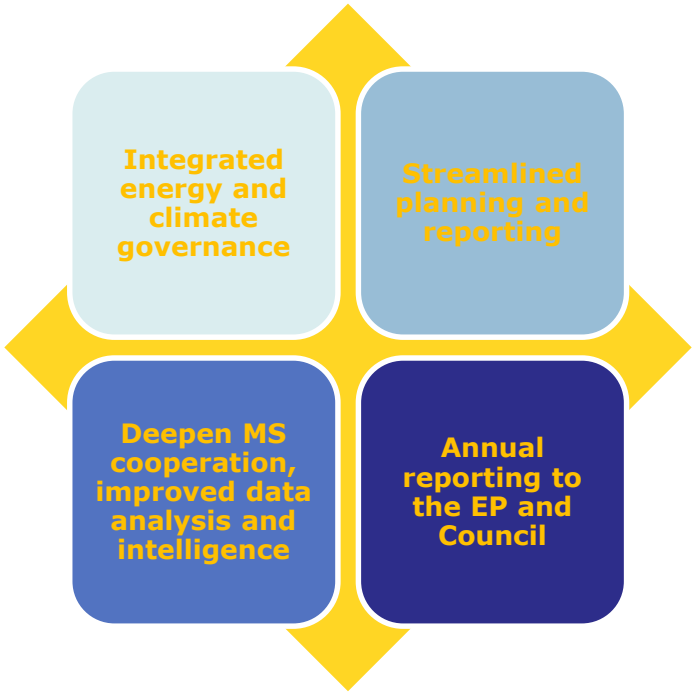
Energy security, solidarity and trust
A fully integrated internal energy market
Energy efficiency first
Transition to a long-lasting low-carbon society
An Energy Union for Research, Innovation and Competiveness

How we want to reach it:

Source: Directorate-General for Energy

Delivering the Energy Union:
A dynamic governance

The Commission will launch a dynamic governance process for the European Energy Union



Successful implementation depends on the political commitment of all actors concerned, including EU institutions and Member States!

Source: Directorate-General for Energy

Key activities relevant to P2G

- **A new market design**
- **Strenghen European regulatory framework**
- **Alternative fuels & integration of energy and transport sectors**
- **Renewables package 2016-2017**
  - **Self-consumption**
  - **Bioenergy sustainability**
  - **post 2020 RES legal framework**
- **Initiative on global technology and innovation leadership on energy and climate**

Source: Directorate-General for Energy

Way forward

- European Council adopted conclusions on the Energy Union at the summit on 19 to 20 March
- VP high-level bilateral meetings with Member States on the Energy Union
- Further guidance on Governance from the Commission during this year
- First report on the state of the Energy Union already in 2015

Energy system investment needs

Total investment needs in the electricity and gas sector between 2010-20: over 1 trillion €

- Power generation: ~ 500 bn
  - RES: ~ 310-370 bn
- Transmission and distribution: ~ 600 bn
  - Distribution: ~ 400 bn
  - Transmission: ~ 200 bn

NB: approximative figures, mainly from DG ENER calculations based on data from PRIMES, ENTSO-E, KEMA, ECOFYS etc.

EU Funding for Sustainable Energy – MFF 2014-2020

- **Cohesion Policy** to allocate some 38 billion € (estimate!) to investments in energy efficiency, renewable energy, smart grids and urban mobility, including research and innovation in those areas in complementarity with Horizon 2020
- **Horizon 2020:** some 5.4 billion € to be allocated to research and innovation in "Secure, clean and efficient energy"
- **Connecting Europe Facility:** some 5 billion € to be allocated to investments in TEN-E infrastructure of highest European added value
- Other **European Structural and Investment (ESI) Funds**:
  - European Agricultural Fund for Rural Development (EAFRD)
  - European Maritime and Fisheries Fund (EMFF)
  - European Social Fund (ESF)
- **LIFE+** and **COSME** might also be relevant for certain aspects
- **EEEF**

"The Juncker Plan"

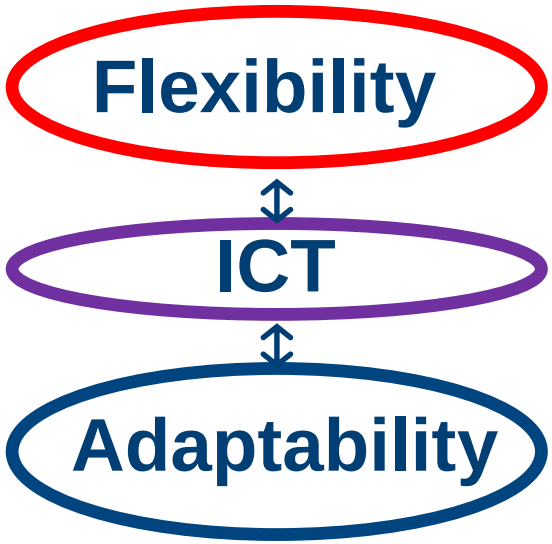
European Fund for Strategic Investments (EFSI)

- Mobilise at least €315 billion in additional investment
- Will finance projects with a higher risk profile
- Established within the European Investment Bank (EIB), with the Commission as strategic partner.

A flexible and adaptive energy system

Smart Energy System

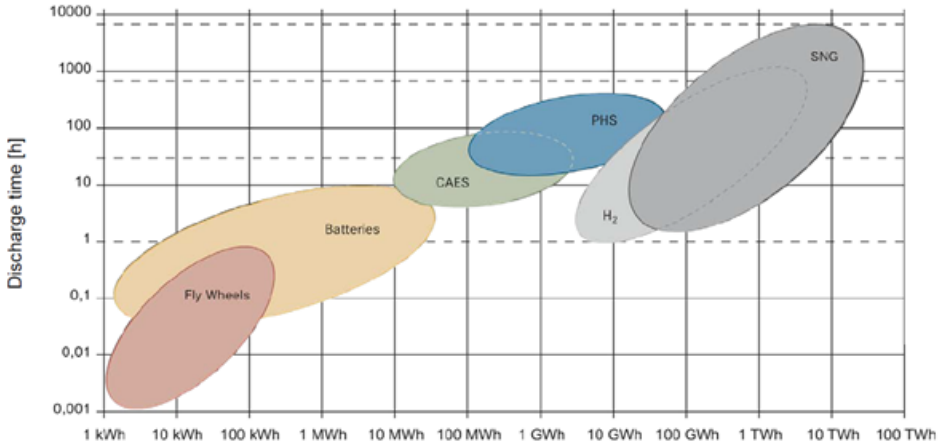
- Generation
- Demand
- Electricity, gas and heat networks
- Storage



Power generation
Grid
Storage
Demand management
Transport; BEV, etc.
Prosumers
Markets
Fuel switching
Avoid lock-in
Adaptation of the gas grid

Flexibility and RES integration

- Diversification of supply and routes is a key component of the EU energy policy
- Strategic energy reserves for crisis situations
- Large scale energy storage could complement strategic energy reserves (oil & gas)
  - Synergies between RES and the natural gas grids
  - Indigenous energy sources more important in future



CAES: Compressed Air Energy Storage
PHS: Pumped Hydro Storage
H_2, SNG: Hydrogen, Synthetic Natural Gas)

Source: Research Center Julich

H2 and Natural Gas

The proposal of integrating P2G with the natural gas grid brings up the issues concerning natural gas and the related infrastructure

- **Technical possibilities: blending & materials**
- **Standards (safety, amount, end-use)**
- **Gas quality: impact of SNG & hydrogen– as well as biomethane**
- **Decarbonisation of the gas infrastructure – scale of impact on objectives**
- **Markets – treatment of the low-carbon/carbon free content of natural gas**
- **Regulatory aspects – access and tariffs**

Energy markets
Regulatory and policy topics - electricity and gas

- The long term investment models for all technologies (FIT, grid fees, etc.)
  - Securing essential long-term investments
- Functionalities of the capacity market schemes
  - Role of gas (NG & H2) as a buffer and for security
- Creation of an electricity market model for balancing and for demand side flexibility.
- The pricing models and network tariff structures which could integrate the increasing variability of power generation.
- Reinforce the governance framework, (incl. distributed generation (RE), storage, smart technologies, etc.)
- Gas quality standards (including the blending and bio-methane)
- Certification (=market) for low-carbon gas (P2G), linking to the electricity market.

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Thank You for Your Attention!

jyri.ylkanen@ec.europa.eu

http://ec.europa.eu/energy